

We Claim:

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1. An *in vivo* process for delivering a polynucleotide to a parenchymal cell of a mammal, comprising:
 - a) inserting the polynucleotide into a blood vessel;
 - b) externally impeding *in vivo* blood flow; and,
 - c) delivering the polynucleotide to the parenchymal cell.
 2. The process of claim 1 wherein the polynucleotide consists of naked DNA.
 3. The process of claim 1 wherein the polynucleotide is selected from the group consisting of a viral vector and a non-viral vector.
 4. The process of claim 1 wherein the polynucleotide consists of a blocking polynucleotide for preventing gene expression.
 5. The process of claim 4 wherein the parenchymal cell consists of a muscle cell.
 6. The process of claim 5 wherein the muscle cell consists of a leg muscle cell.
 7. The process of claim 5 wherein the muscle cell consists of an arm muscle cell.
 8. The process of claim 7 wherein the arm muscle cell consists of an anterior muscle cell.
 9. The process of claim 8 wherein the anterior muscle cell consists of an anterior superficial muscle cell.
 10. The process of claim 8 wherein the anterior muscle cell consists of an anterior deep muscle cell.
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 11. The process of claim 9 wherein the muscle cell is selected from the group consisting of palmaris longus, pronator teres, flexor carpi radialis, flexor carpi ulnaris, and flexor digitorum spf.
 12. The process of claim 10 wherein the muscle cell is selected from the group consisting of flexor digitorum prof., and pronator quadratus.
 13. The process of claim 7 wherein the arm muscle cell consists of a posterior muscle cell.
 14. The process of claim 13 wherein the posterior muscle cell consists of a posterior superficial muscle cell.
 15. The process of claim 13 wherein the posterior muscle cell consists of a posterior deep muscle cell.

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16. The process of claim 14 wherein the muscle cell is selected from the group consisting of brachioradialis, extensor carpi radialis longus, extensor carpi, radialis brevis, extensor digitorum, anconeus, extensor carpi ulnaris, and extensor pollicis longus.
17. The process of claim 15 wherein the muscle cell is selected from the group consisting of supinator, abductor pollicis longus, extensor digiti secund et teriti, and extensor digiti quart et minimi.
18. The process of claim 7 wherein the arm muscle cell consists of a hand muscle cell.
19. The process of claim 18 wherein the hand muscle cell consists of a thumb muscle cell.
20. The process of claim 18 wherein the hand muscle cell consists of an interosseus cell.
21. The process of claim 6 wherein the leg muscle cell consists of a posterior muscle cell.
22. The process of claim 21 wherein the posterior muscle cell consists of a superficial cell.
23. The process of claim 21 wherein the posterior muscle cell consists of a deep cell.
24. The process of claim 22 wherein the superficial cell is selected from the group consisting of gastrocnemius and soleus.
25. The process of claim 23 wherein the deep cell is selected from the group consisting of popliteus, flexor digitorum longus, flexor hallucis longus, and tibialis posterior.
26. The process of claim 6 wherein the leg muscle cell consists of a anterior muscle cell.
27. The process of claim 6 wherein the leg muscle cell consists of an internal muscle cell.
28. The process of claim 6 wherein the leg muscle cell consists of a foot muscle cell.
29. The process of claim 26 wherein the anterior muscle cell is selected from the group consisting of tibialis anterior, extensor hallucis longus, extensor digitorum longus, and abductor hallucis longus.
30. The process of claim 27 wherein the internal muscle cell is selected from the group consisting of peroneus longus and peroneus brevis.
31. The process of claim 28 wherein the foot muscle cell is selected from the group consisting of extensor digitorum brevis and extensor hallucis brevis.
32. The process of claim 1 wherein externally impeding interior blood flow consists of externally applying pressure to interior blood vessels.
33. The process of claim 32 wherein externally applying pressure consists of compressing mammalian skin.
34. The process of claim 33 wherein compressing mammalian skin consists of applying a tourniquet over the skin.

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35. The process of claim 33 wherein compressing mammalian skin consists of applying a cuff over the skin.
36. The process of claim 35 wherein compressing mammalian skin consists of applying a sphygmomanometer cuff over the skin.
37. The process of claim 1 wherein delivery is primarily to limb cells.
38. The process of claim 1 wherein the polynucleotide is delivered to non-vascular parenchymal cells.
- Sub C1 39. An *in vivo* process for delivering a polynucleotide to a mammalian cell, comprising:
- a) inserting the polynucleotide into a blood vessel and applying pressure to the blood vessel wherein the pressure is applied externally to mammalian skin;
 - b) delivering the polynucleotide to the mammalian cell; and,
 - c) maintaining full function of the mammal's limbs subsequent to delivery.
- Feb 21 40. A device for applying pressure to mammalian skin for *in vivo* delivery of a polynucleotide to a mammalian cell, comprising: a cuff used over mammalian skin to impede blood flow thereby increasing delivery efficiency of the polynucleotide to the mammalian cell.

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